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A.D. 1863, 12th JUNE. N° 1475.

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S P E C I F I C A T I O N

OF

JOHN FURNESS TONE.

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PREVENTING SMOKE IN FURNACES.

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LONDON:

PRINTED BY GEORGE E. EYRE AND WILLIAM SPOTTISWOODE,

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Price 4d.

1863.







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Preventing Smoke in Furnaces.

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*(This Invention received Provisional Protection only.)*

**PROVISIONAL SPECIFICATION** left by John Furness Tone at the Office of the Commissioners of Patents, with his Petition, on the 12th June 1863.  
—A communication from abroad by Henry David Furness, of Riga, in the Empire of Russia, Engineer.

- 5 I, JOHN FURNESS TONE, of the Town and County of Newcastle-upon-Tyne, Civil Engineer, do hereby declare the nature of the said Invention for “**IMPROVEMENTS IN THE PREVENTION OF SMOKE IN STEAM BOILERS AND OTHER FURNACES,**” a communication from abroad by Henry David Furness, of Riga, in the Empire of Russia, Engineer, to be as follows:—
- 10 This Invention relates to a peculiar combination and arrangement of apparatus for preventing smoke in steam boiler and other furnaces, whereby a more perfect combustion is obtained and a considerable economy of fuel effected. According to this Invention, as applied to an ordinary locomotive boiler, it is proposed to employ a small steam pipe, which is carried from any convenient
- 15 part of the boiler through the fire-box and through one of the ordinary tubes of the boiler, and extends to the front of the smoke box. At this part it is provided with outlets or nozzles through which the steam in a superheated state is discharged into a corresponding series of tubes which pass through the smoke box and communicate with some of the ordinary boiler tubes. By this
- 20 arrangement of apparatus a current or currents of heated air and superheated steam are directed into the furnace so as to mingle with the gases and products of combustion at the moment of the formation. The nozzles or outlets

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*Tone's Impts. in the Prevention of Smoke in Steam Boilers and other Furnaces.*

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of the steam pipe are placed some little distance from the mouths of the air pipes, so that the air will enter freely into such pipes, and be then carried along into the furnace by the steam jets above referred to.

In adapting this Invention to a marine boiler the steam pipe is carried from a convenient part of the boiler through the smoke box, where the steam 5 becomes superheated and thence passes to a pipe or pipes situate underneath the grate bars, into and through which the superheated steam is injected, so as to carry with it a current or currents of heated air, which are directed on to the back part of the fire, so as to mingle with the gases at the best point for combustion. In an ordinary boiler or furnace the steam is brought direct from the 10 boiler by a proper steam pipe to the mouths of one or more air tubes placed under the grate bars, and passing up through the bridge or otherwise into the back of the furnace, the air becoming heated as it passes along the air tubes before entering the furnace.

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Printers to the Queen's most Excellent Majesty. 1863.